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(54) Translation communication system

Übertragungssystem mit Übersetzung

Système de communication avec traduction

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Description

(1) Field of the Invention

The present invention relates to a system of communication between two parties which also performs translation.

(2) Description of the Prior Art

Recently, communication channels using computers have been developed. For example, communications are possible between online terminals with which several users transmit and receive information using displays. The terminals have a common host or are interconnected with a network. Development has also begun on a translation communication system in which such a communication system is combined with machine translation apparatus. This system is supposed to display transmitted or received natural language information between terminals after being translated, and is supposed to communicate natural language information smoothly for several users who speak different languages respectively.

In such a translation communication system, however translation processing should be performed in real time. Therefore a user (transmitter) cannot edit his language information sufficiently as compared with normal machine translation apparatus. Moreover, conversation sentences to be translated include many omissions. Therefore translation processing in the system lacks information for determining a translation for such incomplete sentences.

It is known (e.g. from EP-A-189 665) to obtain interactively the translation possibilities for a word from a dictionary, the display priority order of the transmissions being determined by stored data.

Accordingly the present invention provides a translation communication system between a first native speaker of a first natural language using his mother tongue and a second native speaker of a second natural language also using his mother tongue, having translation means for translating an input sentence from said first native speaker in said first language into said second language by using a dictionary, comprising:

memory means for storing previous original sentences used by said second native speaker in said second language and corresponding translated sentences in said first language, and translated information including pairs of words or phrases in the two languages, which have been determined to correspond to one another during translation of previous communications; and means for

(a) searching the translated sentences in said first language stored in said memory means, to locate a previously translated sentence containing input word included in said input sentence, if said translation means cannot translate said input word;
(b) identifying the original word included in said previous original sentence in said second language corresponding to the located translated sentence and relating to said input word; and
(c) supplying the original word in said second language as the translated information of said input word to said translation means.

The invention also extends to a translation communication system between a first native speaker of a first natural language using his mother tongue and a second native speaker of a second natural language also using his mother tongue, having first translation means for translating an input sentence from said first native speaker in said first language into said second language by using a first dictionary and second translation means for translating input sentence by said second native speaker in said second language into said first language by using a second dictionary, comprising:

first memory means for storing previous original sentences used by said second native speaker from previous communications in said second language and corresponding translated sentences translated by said second translation means into said first language, and translated information for each of said previous original sentences and corresponding translated sentences, including previous original words in said previous original sentences and translated words in said translated sentences corresponding to said previous original words, respectively;
second memory means for storing previous original sentences used by said first native speaker from previous communications in said first language and corresponding translated sentences translated by said first translation means into said second language, and translated information for each of said previous original sentences and corresponding translated sentences, including previous original words in said previous original sentences and translated words in said translated sentences corresponding to said previous original words, respectively; and means for:
(a) searching said translated sentences in said first language stored in said first memory means to locate a previously translated sentence in said first language containing a first language input word included in said input sentence in said first language, if said first translation means cannot translate said first language input word;
(b) identifying a second language original word included in said previous original sentence in said second language corresponding to the located translated sentence and relating to said first language input word;
(c) supplying said second language original word

as translated information of said first language input word to said first translation means;

(d) searching said translated sentences in said second language stored in said second memory means to locate a previously translated sentence in said second language containing a second language input word included in said input sentence in said second language, if said second translation means can not translate said second language input word;

(e) identifying a first language original word included in said previous original sentence in said first language corresponding to the located translated sentence and relating to said second language input word; and

(f) supplying said first language original word as translated information of said second language input word to said second translation means.

BRIEF DESCRIPTION OF DRAWINGS

FIGURE 1 shows a construction of a translation communication system according to one embodiment of the present invention;

FIGURE 2 shows details of each section and the flow of information in FIGURE 1;

FIGURE 3 shows information stored in the Japanese translated information memory in FIGURE 2;

FIGURES 4(a), 4(b) and 4(c) show concrete examples of processing by the translation information supply section according to one embodiment of the present invention; and

FIGURE 5 shows a flow chart for detailed processing in accordance with FIGURE 4(a).

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIGURE 1 shows the construction of a translation communication system equipped at a communication terminal according to one embodiment of the present invention. This system will be explained as a mutual translation system between a first language "Japanese" and a second language "English".

This system comprises an input section 1 which may be a keyboard, a display section 2 for displaying characters, a translation section 3 for translating Japanese into English and English into Japanese, communication section 4 for transmitting and receiving information between outside equipment 8 (for example, another communication terminal or a host) and this system, translation communication control section 5, translation communication information memory 6 and translation information supply section 7, which supplies information for determining an adequate translated word.

The translation communication control section 5 transfers original sentences (Japanese) from the input section 1 to the display section 2 and the translation section 3, transfers corresponding translated sentences (English) from the translation section 3 to the communication section 4, transfers original sentences (English) from the communication section 4 through the outside equipment 8 to the translation section 3, and transfers corresponding translated sentences (Japanese) from the translation section 3 to the display section 2.

The translation communication information memory 6 stores communication information (comprising previous original sentences and their translated sentences) and translated information (comprising pairs of original words and their translated counterparts and so on) between Japanese and English. The translation information supply section 7 retrieves the communication information from the translation communication information memory 6 in accordance with an input original sentence transmitted to the translation section 3, and supplies a pair including an original word of the original sentence and its translated word in accordance with the retrieval result to the translation section 3 as information for determining an adequate translated word.

FIGURE 2 shows the flow of information among each of the sections illustrated in FIGURE 1. Display section 2 is composed of display portion 2a for displaying original sentences (Japanese) input through the input section 1 by user A who speaks Japanese, and display portion 2b for displaying translated sentences (Japanese) in correspondence with original sentences (English) input through the outside equipment 8 by user B who speaks English. Translation section 3 is composed of Japanese translation section 3a for translating Japanese into English, and English translation section 3b for translating English into Japanese. Translation sections 3a and 3b include well known translation dictionaries for initiating the translation process. Translation communication information memory 6 is composed of English translation information memory 6a being used by Japanese translation section 3a, and Japanese translation communication information memory 6b being used by English translation section 3b.

Next, the operation of each of the sections illustrated in FIGURE 1 will be explained referring to FIGURE 2. Suppose a Japanese sentence (original sentence by user A) is input from input section 1, and an English sentence (original sentence by user B) is input through communication section 4 from outside equipment 8. The Japanese sentence from input section 1, which was input by user A, is transferred to Japanese translation section 3a, display portion 2a and Japanese section translation information memory 6a through translation communication control section 5. A translated English sentence (as a translated sentence, translated from the Japanese sentence) from Japanese translation section 3a is transferred to communication section 4 and Japanese translation communication memory 6b through translation communication control section 5. Japanese translation communication information memory 6b stores Japanese sentences (as past original sentences) and correspondingly translated English sentences (as past translated sentences in accordance with the past

original sentence) respectively, and Japanese words (as original words in the past original sentences) and correspondingly translated English words (as translated words, in the past translated sentences, in accordance with the original words) respectively, as will be seen later. When Japanese translation section 3a begins to translate a present original sentence, when its internal dictionary is incapable of accurate translation, translation information supply section 7 receives the present original sentence (Japanese) from Japanese translation section 3a, and retrieves information stored in English translation communication information memory 6a according to the present original sentence. Section 7 selects information for determining an adequate translated word and supplies it to Japanese translation section 3a. In the same way, an English sentence (as original sentence) from communication section 4 is processed.

FIGURE 3 shows detailed information stored in Japanese translation communication information memory 6b. This memory stores communication information including original sentences 32 and translated sentences 33 in accordance with the original sentences, translated information 34 and sentence number 31. In this case, the original sentences are in Japanese and the correspondingly translated sentences are in English.

For example, when original sentence "WATASHI WA SATO DESU" (in Japanese meaning "I am Sato") is input, "WATASHI WA SATO DESU", as an original sentence, is stored in area 32, and "I am Sato" as its translated sentence is stored in area 33. At the same time, pairs of original words and their correspondingly translated words, e.g., "WATASHI-I", "SATO-Sato", and "DESU-be', and sentence structure information "subject-I, complement-Sato, predicate-be" are stored as translated information 34. Sentence number information 31 represents the input order of each original sentence in a conversation between user A and user B.

In the same way, English translation communication information memory 6a stores communication information comprised of English sentences (as original sentences) and Japanese sentences (as their correspondingly translated sentences), and translated information including sentence structure information, pairs of original words and their correspondingly translated words.

Next, the processing of translation information supply section 7 will be explained referring to FIGURES 4 (a) - 4(c). To begin with, as the first example as shown in FIGURE 4(a), user B inputs the original sentence "Please give me a crash course in Japanese.", and its translated sentence (in Japanese) "WATASHI NI NIHONGO NO OHKYUTEKINA KOSHU O ATAETEKUDASAI." is displayed on user A's display section. The translation may be prepared, for example, using the conventional dictionary in English translation section 3b. At the same time, the original sentence, its translation, etc. are stored in English translation communication information memory 6b. After looking at this Japanese sentence, user A inputs Japanese sentence "OHKYUTEKINA KOHSU TOWA NANDESUKA?" as a question.

When the Japanese sentence is input to Japanese translation section 3a, the section 3a transfers the sentence to translation information supply section 7. The supply section 7 retrieves from English translation communication information memory 6a the past translated sentence with the largest sentence number having the original word "OHKYUTEKINA". It is necessary to consult memory 6a because the dictionary in translation section 3a includes several translated word candidates. Section 7 finds "OHKYUTEKINA" as a translated word in the translated sentence stored in memory 6a, extracts the original word "crash" corresponding to the translated word "OHKYUTEKINA" from translated information having the same sentence number, and transfers "OHKYUTEKINA-crash" as an original word/translated word pair to Japanese translation section 3a. After the pair is input in Japanese translation section 3a, section 3a selects "crash" as an adequate translated word for "OHKYUTEKINA" instead of "emergency" (which is the first translated word for "OHKYUTEKINA" in a regular Japanese-English dictionary such as contained in memory 3a), and generates a translated sentence "What is a crash course?."

FIGURE 5 shows a flow chart of the detailed processing necessary for FIGURE 4(a). At first, when an original sentence is input, a word pointer is set at the first word in the original sentence, and it is checked whether the word pointer points to the end of the original sentence (S1,S2,S3). If the word pointer points to the end of the original sentence, already obtained translation information is supplied (S4), and the processing is returned to S1. If the word pointer does not point to the end of the original sentence, it is checked whether a retrieval flag has been added to the word pointed to by the word pointer (S5). If the retrieval flag is not added, the word pointer is moved forward by one word in the original sentence (S6), and the processing is returned to S3. The retrieval flag is added to the original word by translation section 3 when translation by a dictionary alone is not sufficient and translation information from prior communications is needed. Such situations occur depending on the part of speech of the word and whether the word has many translated word candidates.

If the retrieval flag has been added, a translated sentence pointer is set at the translated sentence having the largest sentence number stored in translation communication information memory 6, and it is checked whether retrieval end flag is added to the translated sentence pointed to by the translated sentence pointer (S7, S8). The reason why the translated sentence pointer is set at the largest sentence number is that translation information should be extracted from the newest translated sentence in past conversation. Older translated sentences having smaller sentence numbers may often include the word presently being translated. However, the earlier translation of that word may not have been ideal.

If the translation of the word was used by the native language user in a more recent sentence, usually that translation is preferable. Therefore, the retrieval end flag is added to older translated sentences having smaller sentence numbers, for example, sentences having sentence numbers less than the third sentence number from the largest sentence number in numerical reverse order. These sentences without the retrieval end flag may be referred to as the immediately previous sentences.

If the retrieval end flag is added to the translated sentence pointed to by the translated sentence pointer, the word pointer is moved forward by one word in the original sentence (S9), and the processing returns to S3. If the retrieval end flag is not added to the translated sentence pointed to by the translated sentence pointer, the translated word pointer is set at the first word in the pointed to translated sentence (S10).

Next, it is checked whether the translated word pointer points to the end of the pointed to translated sentence (S11). If so, the translated sentence pointer is moved back (decreased) by 1 sentence among the past translated sentences (S12), and the processing returns to S8. If the translated word pointer does not point to the end of the pointed to translated sentence, it is checked whether the word pointed to by the word pointer matches the word pointed to by the translated word pointer (S13). If it does not match, the translated word pointer is moved forward by 1 word (S14) and the processing returns to S11. If it matches, the word pointed to by the word pointer is stored in a word buffer and the original word corresponding to the pointed to translated word is stored in a translated word buffer (S15). (The word buffer and the translated word buffer are not illustrated.) Then the word pointer is moved forward by 1 word (S16) and the processing returns to S3. The original word stored in the translated word buffer is used as the translation of the word in the original sentence pointed to by the word pointer.

Thus, an important concept of this invention is that sentences input by a native speaker in his language are stored during a conversation along with a translation of the sentence. Presumably, the native language sentence is a proper sentence in the native language even if the translation may not be perfect. Then, when a translation is desired into the native language, the native language sentence previously stored is the source of the translation. This helps to ensure that the translation into the native language is as correct as possible.

Next, as the second example in FIGURE 4(b), user A inputs the original sentence (Japanese) "TENKIWA DOHDESUKA?" and its translation (English) "How is the weather?" is displayed on user B's display section employing conventional translation techniques. After looking at this English sentence, user B inputs the English answer "fine". English translation section 3b analyzes this answer and finds that the answer does not have a subject. Therefore, section 3b sends a request signal to translation information supply section 7. On receiving the request signal translation information supply section 7 retrieves translated information stored in Japanese translation communication information memory 6b. Section 7 extracts sentence structure information from the newest translated sentence (having the largest sentence number). In that sentence ("How is the weather? "), "weather" is the subject. This structure information, "Subject = weather", is sent to English translation section 3b. By using this information, from among "SUBARASHII", "HARE" and "GENKI" (all translated word candidates (Japanese) for "fine"), English translation section 3b selects "HARE" (which is the only word related to the weather in Japanese) and generates the Japanese answer "HARE DESU".

If the newest translated sentence had been "How are you?", section 3b would have selected "GENKI" (which is the only word of the possibilities related to health in Japanese) and would have generated the Japanese answer "GENKI DESU".

Lastly, as a third example in FIGURE 4(c), user B inputs "I came from Saudi Arabia." and its translated result (Japanese) "WATASHI WA SAUJIARABIA KARA KIMASHITA." is displayed on user A's display section. After looking at this Japanese sentence, user A inputs "WATASHI WA SAUJIARABIA NI ITTAKOTO GA ARIMASEN." If Japanese translation section 3a cannot find the translation for "SAUJIARABIA" in its Japanese-English dictionary, the section 3a sends to translation information supply section 7 a request signal that "SAUJIARABIA" is an unknown word. Thereupon, section 7 retrieves translated information stored in English translation communication information memory 6a by extracting the original word/translated word pair "SAUJIARABIA-Saudi Arabia" and sending this information to Japanese translation section 3a. By using this information, Japanese translation section 3a generates the English sentence "I have not been to Saudi Arabia."

In the present invention, translation information supply section 7 retrieves information stored in translation communication information memory 6 when a more simple translation using the dictionaries of translation section 3 is not possible or adequate. The information (for example, an original word/translated word pair) is supplied to translation section 3 for selecting an adequate translated word. This information is derived from a prior portion of the conversation which has been stored along with its translation. Therefore, translation section 3 can determine an adequate translated word and the quality of translation is extremely improved. Accordingly, several users can communicate with each other smoothly.

Moreover, the present invention is not limited to the above embodiment. For example, in the above embodiment, the translation section, having both functions for translating Japanese into English and for translating English into Japanese, is equipped at one side's communication terminal. It is possible that one side's termi-

nal be equipped with a translation section having one function and another side's terminal be equipped with a translation section having the other function. In this case, the translation communication information memory can be equipped at only one terminal or can be decentralized at both terminals. In short, if the necessary information is transferred through a communication section, it is possible to perform processing as described with respect to the above embodiment.

With a communication system including a host with a translation function between terminals, the host may be equipped with a translation communication information memory and translation information supply section. In short, components of the present invention can be placed in any variety of configurations.

The above embodiment is explained in reference to translation between English and Japanese. However, the present invention can be applied to translation between other languages.

Although only a few exemplary embodiments of this invention have been described in detail above, those skilled in the art will readily appreciate that many modifications are possible in the preferred embodiments without materially departing from the novel teachings and advantages of this invention.

Claims

1. A translation communication system between a first native speaker of a first natural language using his mother tongue and a second native speaker of a second natural language also using his mother tongue, having translation means for translating an input sentence from said first native speaker in said first language into said second language by using a dictionary, comprising:

   memory means for storing previous original sentences used by said second native speaker in said second language and corresponding translated sentences in said first language, and translated information including pairs of words or phrases in the two languages, which have been determined to correspond to one another during translation of previous communications; and means for

   (a) searching the translated sentences in said first language stored in said memory means, to locate a previously translated sentence containing input word included in said input sentence, if said translation means cannot translate said input word;
   (b) identifying the original word included in said previous original sentence in said second language corresponding to the located translated sentence and relating to said input word; and
   (c) supplying the original word in said second language as the translated information of said input word to said translation means.

2. A translation communication system according to claim 1 wherein said searching means matches individual words of said previous original sentences with selected individual input words of said input original sentence.

3. A translation communication system according to claim 1 or claim 2 wherein said translated information includes sentence structure information of the corresponding previous original sentences.

4. A translation communication system according to claim 3 wherein said supply means also extracts said sentence structure information corresponding to said previous original sentence from communications immediately previous to said input original sentence when said input original sentence is not a complete sentence.

5. A translation communication system according to any preceding claim wherein said translating means includes a dictionary and said identification means is adapted to identify said translated information corresponding to any input word of the input original sentence not included in said dictionary.

6. A translation communication system, according to any preceding claim wherein each of said previous original sentences is allocated a sentence number indicative of the temporal order of said previous communications from which said previous original sentences are obtained.

7. A translation communication system according to any one of claims 1, 3, 4, 6 or 7 wherein said memory means stores said previous original sentences including corresponding translated sentences in said first language from previous communications in said second language and translated information including words in said second language and corresponding translations in said first language.

8. A translation communication system between a first native speaker of a first natural language using his mother tongue and a second native speaker of a second natural language also using his mother tongue, having first translation means for translating an input sentence from said first native speaker in said first language into said second language by using a first dictionary and second translation means for translating input sentence by said second native speaker in said second language into said first language by using a second dictionary, comprising:

   first memory means for storing previous original

sentences used by said second native speaker from previous communications in said second language and corresponding translated sentences translated by said second translation means into said first language, and translated information for each of said previous original sentences and corresponding translated sentences. including previous original words in said previous original sentences and translated words in said translated sentences corresponding to said previous original words, respectively.

second memory means for storing previous original sentences used by said first native speaker from previous communications in said first language and corresponding translated sentences translated by said first translation means into said second language, and translated information for each of said previous original sentences and corresponding translated sentences including previous original words in said previous original sentences and translated words in said translated sentences corresponding to said previous original words, respectively; and means for

(a) searching said translated sentences in said first language stored in said first memory means to locate a previously translated sentence in said first language containing a first language input word included in said input sentence in said first language if said first translation means cannot translate said first language input word

(b) identifying a second language original word included in said previous original sentence in said second language corresponding to the located translated sentence and relating to said first language input word.

(c) supplying said second language original word as translated information of said first language input word to said first translation means;

(d) searching said translated sentences in said second language stored in said second memory means to locate a previously translated sentence in said second language containing a second language input word included in said input sentence in said second language, if said second translation means can not translate said second language input word;

(e) identifying a first language original word included in said previous original sentence in said first language corresponding to the located translated sentence and relating to said second language input word and

(f) supplying said first language original word as translated information of said second language input word to said second translation means.

Patentansprüche

1. Übersetzungs/Kommunikations-System zwischen einem ersten Muttersprachler mit einer ersten natürlichen Sprache, der seine Muttersprache verwendet, und einem zweiten Muttersprachler mit einer zweiten natürlichen Sprache, der ebenfalls seine Muttersprache verwendet, das eine Übersetzungseinrichtung umfaßt, um unter Verwendung eines Wörterbuches einen in der ersten Sprache eingehenden Satzes von dem ersten Muttersprachler in die zweite Sprache zu übersetzen, mit:

   einer Speichereinrichtung zum Speichern von früheren ursprünglichen Sätzen, die von dem zweiten Muttersprachler in der zweiten Sprache verwendet wurden, und von entsprechenden übersetzten Sätzen in der ersten Sprache sowie von übersetzten Informationen, die Paare von Wörtern oder Satzteilen in beiden Sprachen enthalten, für die bei der Übersetzung von früheren Kommunikationen bestimmt wurde, daß sie einander entsprechen; und Einrichtungen zum

   (a) Suchen der übersetzten Sätze in der ersten Sprache, die in der Speichereinrichtung gespeichert sind, um einen früher übersetzten Satz zu finden, der ein eingehendes Wort enthält, das in dem eingehenden Satz enthalten ist, wenn die Übersetzungseinrichtung das eingehende Wort nicht übersetzen kann;

   (b) Identifizieren des ursprünglichen Wortes, das in dem früheren urprünglichen Satz in der zweiten Sprache enthalten ist, der dem gefundenen übersetzten Satz entspricht, und mit dem eingehenden Wort in Beziehung steht; und

   (c) Liefern des ursprünglichen Wortes in der zweiten Sprache als die übersetzte Information des eingehenden Wortes zu der Übersetzungseinrichtung.

2. Übersetzungs/Kommunikations-System nach Anspruch 1, bei dem die Sucheinrichtung einzelne Wörter der früheren ursprünglichen Sätze mit ausgewählten einzelnen eingehenden Wörtern des eingehenden ursprünglichen Satzes in Beziehung setzt.

3. Übersetzungs/Kommunikations-System nach Anspruch 1 oder 2, bei dem die übersetzte Information eine Satzstrukturinformation der entsprechenden früheren ursprünglichen Sätze enthält.

4. Übersetzungs/Kommunikations-System nach Anspruch 3, bei dem die Liefereinrichtung außerdem

die Satzstrukturinformation, die dem früheren ursprünglichen Satz entspricht, aus Kommunikationen unmittelbar vor dem eingehenden ursprünglichen Satz herauszieht, wenn der eingehende ursprüngliche Satz kein vollständiger Satz ist.

5. Übersetzungs/Kommunikations-System nach einem der vorhergehenden Ansprüche, bei dem die Übersetzungseinrichtung ein Wörterbuch enthält und die Identifikationseinrichtung dazu ausgestaltet ist, um die übersetzte Information zu identifizieren, die irgendeinem eingehenden Wort des eingehenden ursprünglichen Satzes entspricht, das nicht in dem Wörterbuch enthalten ist.

6. Übersetzungs/Kommunikations-System nach einem der vorhergehenden Ansprüche, bei dem jedem der früheren ursprünglichen Sätze einer Satznummer zugewiesen ist, die die zeitliche Reihenfolge der früheren Kommunikationen angibt, von denen die früheren ursprünglichen Sätze erhalten wurden.

7. Übersetzungs/Kommunikations-System nach einem der Ansprüche 1, 3, 4, 6 oder 7, bei dem die Speichereinrichtung die früheren ursprünglichen Sätze einschließlich der entsprechenden übersetzten Sätze in der ersten Sprache von früheren Kommunikationen in der zweiten Sprache sowie übersetzte Informationen einschließlich Wörter in der zweiten Sprache und entsprechende Übersetzungen in der ersten Sprache speichert.

8. Übersetzungs/Kommunikations-System zwischen einem ersten Muttersprachler mit einer ersten natürlichen Sprache, der seine Muttersprache verwendet, und einem zweiten Muttersprachler mit einer zweiten natürlichen Sprache, der ebenfalls seine Muttersprache verwendet, das eine erste Übersetzungseinrichtung, um unter Verwendung eines ersten Wörterbuches einen in der ersten Sprache eingehenden Satz von dem ersten Muttersprachler in die zweite Sprache zu übersetzen, und eine zweite Übersetzungseinrichtung umfaßt, um unter Verwendung eines zweiten Wörterbuches einen in der zweiten Sprache eingehenden Satz von dem zweiten Muttersprachler in die erste Sprache zu übersetzen, mit:

einer ersten Speichereinrichtung zum Speichern von früheren ursprünglichen Sätzen, die von dem zweiten Muttersprachler bei früheren Kommunikationen in der zweiten Sprache verwendet wurden, und von entsprechenden übersetzten Sätzen, die von der zweiten Übersetzungseinrichtung in die erste Sprache übersetzt wurden, sowie von übersetzten Informationen für jeden der früheren ursprünglichen Sätze und der entsprechenden übersetzten Sätze, einschließlich frühere ursprüngliche Wörter in den früheren ursprünglichen Sätzen und übersetzte Wörter in den übersetzten Sätzen, die den früheren ursprünglichen Wörtern entsprechen;

einer zweiten Speichereinrichtung zum Speichern von früheren ursprünglichen Sätzen, die von dem ersten Muttersprachler bei früheren Kommunikationen in der ersten Sprache verwendet wurden, und von entsprechend übersetzten Sätzen, die von der ersten Übersetzungseinrichtung in die zweite Sprache übersetzt wurden, sowie von übersetzten Informationen für jeden der früheren ursprünglichen Sätze und der entsprechenden übersetzten Sätze, einschließlich frühere ursprüngliche Wörter in den früheren ursprünglichen Sätzen und übersetzte Wörter in den übersetzten Sätzen, die den früheren ursprünglichen Wörtern entsprechen; und Einrichtungen zum:

(a) Suchen der übersetzten Sätze in der ersten Sprache, die in der ersten Speichereinrichtung gespeichert sind, um einen früher übersetzten Satz in der ersten Sprache zu finden, der ein eingehendes Wort in der ersten Sprache enthält, das in dem eingehenden Satz in der ersten Sprache enthalten ist, wenn die erste Übersetzungseinrichtung das eingehende Wort in der ersten Sprache nicht übersetzen kann;

(b) Identifizieren eines ursprünglichen Wortes in der zweiten Sprache, das in dem früheren ursprünglichen Satz in der zweiten Sprache enthalten ist, der dem gefundenen übersetzten Satz entspricht, und mit dem eingehenden Wort in der ersten Sprache in Beziehung steht;

(c) Liefern des ursprünglichen Wortes in der zweiten Sprache als übersetzte Information des eingehenden Wortes in der ersten Sprache zu der ersten Übersetzungseinrichtung;

(d) Suchen der übersetzten Sätze in der zweiten Sprache, die in der zweiten Speichereinrichtung gespeichert sind, um einen früher übersetzten Satz in der zweiten Sprache zu finden, der ein eingehendes Wort in der zweiten Sprache enthält, das in dem eingehenden Satz in der zweiten Sprache enthalten ist, wenn die zweite Übersetzungseinrichtung das eingehende Wort in der zweiten Sprache nicht übersetzen kann;

(e) Identifizieren eines ursprünglichen Wortes in der ersten Sprache, das in dem früheren ursprünglichen Satz in der ersten Sprache enthalten ist, der dem gefundenen übersetzten Satz entspricht, und mit dem eingehenden Wort in der zweiten Sprache in Beziehung steht; und

(f) Liefern des ursprünglichen Wortes in der er-

sten Sprache als übersetzte Information des eingehenden Wortes in der zweiten Sprache zu der zweiten Übersetzungseinrichtung.

Revendications

1. Système de communication avec traduction entre un premier locuteur ayant une première langue naturelle, utilisant sa langue maternelle, et un deuxième locuteur ayant une deuxième langue naturelle, utilisant également sa langue maternelle, comportant des moyens de traduction pour traduire une phrase d'entrée provenant du premier locuteur, dans ladite première langue, en ladite deuxième langue, en utilisant un dictionnaire comprenant:

   des moyens de mémoire pour stocker des phrases d'origine précédentes utilisées par ledit deuxième locuteur, dans ladite deuxième langue, et des phrases traduites correspondantes, dans ladite première langue, et des informations traduites comportant des couples de mots ou phrases dans les deux langues, qui ont été déterminés correspondre entre eux lors de la traduction de communications précédentes; et des moyens pour

   (a) rechercher les phrases traduites dans ladite première langue stockées dans lesdits moyens de mémoire, pour localiser une phrase précédemment traduite contenant un mot d'entrée inclus dans ladite phrase d'entrée, si lesdits moyens de traduction ne peuvent pas traduire ledit mot d'entrée;
   (b) identifier le mot d'origine inclus dans ladite phrase d'origine précédente, dans ladite deuxième langue, correspondant à la phrase traduite localisée, et concernant ledit mot d'entrée; et
   (c) fournir le mot d'origine dans ladite deuxième langue en tant qu'informations traduites dudit mot d'entrée, auxdits moyens de traduction.

2. Système de communication avec traduction selon la revendication 1, dans lequel lesdits moyens de recherche font correspondre des mots individuels desdites phrases d'origine précédentes à des mots d'entrée individuels sélectionnés de ladite phrase d'origine d'entrée.

3. Système de communication avec traduction selon la revendication 1 ou la revendication 2, dans lequel lesdites informations traduites comportent des informations de structure de phrase des phrases d'origine précédentes correspondantes.

4. Système de communication avec traduction selon la revendication 3, dans lequel lesdits moyens de fourniture extraient également lesdites informations de structure de phrase correspondant à ladite phrase d'origine précédente d'après des communications immédiatement précédentes à ladite phrase d'origine d'entrée lorsque ladite phrase d'origine d'entrée n'est pas une phrase complète.

5. Système de communication avec traduction selon l'une quelconque des revendications précédentes, dans lequel lesdits moyens de traduction comportent un dictionnaire, et lesdits moyens d'identification sont prévus pour identifier lesdites informations traduites correspondant à un mot d'entrée quelconque de la phrase d'origine d'entrée, non inclus dans ledit dictionnaire.

6. Système de communication avec traduction selon l'une quelconque des revendications précédentes, dans lequel à chacune desdites phrases d'origine précédentes est alloué un numéro de phrase indiquant l'ordre temporel desdites communications précédentes, d'après lesquelles lesdites phrases d'origine précédentes ont été obtenues.

7. Système de communication avec traduction selon l'une quelconque des revendications 1, 3, 4, 6 ou 7, dans lequel lesdits moyens de mémoire contiennent lesdites phrases d'origine précédentes, comportant les phrases traduites correspondantes dans ladite première langue, d'après des communications précédentes dans ladite deuxième langue, et des informations traduites comportant des mots dans ladite deuxième langue et des traductions correspondantes dans ladite première langue.

8. Système de communication avec traduction entre un premier locuteur ayant une première langue naturelle, utilisant sa langue maternelle, et un deuxième locuteur ayant une deuxième langue naturelle, utilisant également sa langue maternelle, comportant des premiers moyens de traduction pour traduire une phrase d'entrée provenant du premier locuteur, dans ladite première langue, en ladite deuxième langue, en utilisant un premier dictionnaire, et des deuxièmes moyens de traduction pour traduire la phrase d'entrée dudit deuxième locuteur, dans ladite deuxième langue, en ladite première langue, en utilisant un deuxième dictionnaire, comprenant:

   des premiers moyens de mémoire pour stocker des phrases d'origine précédentes utilisées par ledit deuxième locuteur, d'après des communications précédentes dans ladite deuxième langue, et des phrases traduites correspondantes, traduites par lesdits deuxièmes moyens de traduction dans ladite première langue, et des informations traduites pour chacune desdites phrases d'origine précédentes et phrases tra-

duites correspondantes, comportant des mots d'origine précédents desdites phrases d'origine précédentes et des mots traduits dans lesdites phrases traduites, correspondant respectivement auxdits mots d'origine précédents;
des deuxièmes moyens de mémoire pour stocker des phrases d'origine précédentes utilisées par ledit premier locuteur, d'après des communications précédentes dans ladite première langue, et des phrases traduites correspondantes, traduites par lesdits premiers moyens de traduction dans ladite deuxième langue, et des informations traduites pour chacune desdites phrases d'origine précédentes et phrases traduites correspondantes, comportant des mots d'origine précédents desdites phrases d'origine précédentes et des mots traduits dans lesdites phrases traduites, correspondant respectivement auxdits mots d'origine précédents; et des moyens pour
(a) rechercher les phrases traduites dans ladite première langue stockées dans lesdits premiers moyens de mémoire, pour localiser une phrase précédemment traduite dans ladite première langue contenant un mot d'entrée de la première langue inclus dans ladite phrase d'entrée dans ladite première langue, si lesdits premiers moyens de traduction ne peuvent pas traduire ledit mot d'entrée de la première langue;
(b) identifier un deuxième mot d'origine de la deuxième langue inclus dans ladite phrase d'origine précédente dans ladite deuxième langue, correspondant à la phrase traduite localisée, et concernant ledit mot d'entrée de la première langue
(c) fournir ledit mot d'origine de la deuxième langue, en tant qu'informations traduites dudit mot d'entrée de la première langue, auxdits premiers moyens de traduction;
(d) rechercher lesdites phrases traduites dans ladite deuxième langue stockées dans lesdits deuxièmes moyens de mémoire pour localiser une phrase précédemment traduite dans ladite deuxième langue contenant un mot d'entrée de la deuxième langue inclus dans ladite phrase d'entrée dans ladite deuxième langue, si lesdits deuxièmes moyens de traduction ne peuvent pas traduire ledit mot d'entrée de la deuxième langue
(e) identifier un mot d'origine de la première langue inclus dans ladite phrase d'origine précédente, dans ladite première langue, correspondant à la phrase traduite localisée, et concernant ledit mot d'entrée de la deuxième langue; et
(f) fournir ledit mot d'origine de la première langue en tant qu'informations traduites dudit mot d'entrée de la deuxième langue, auxdits deuxièmes moyens de traduction.

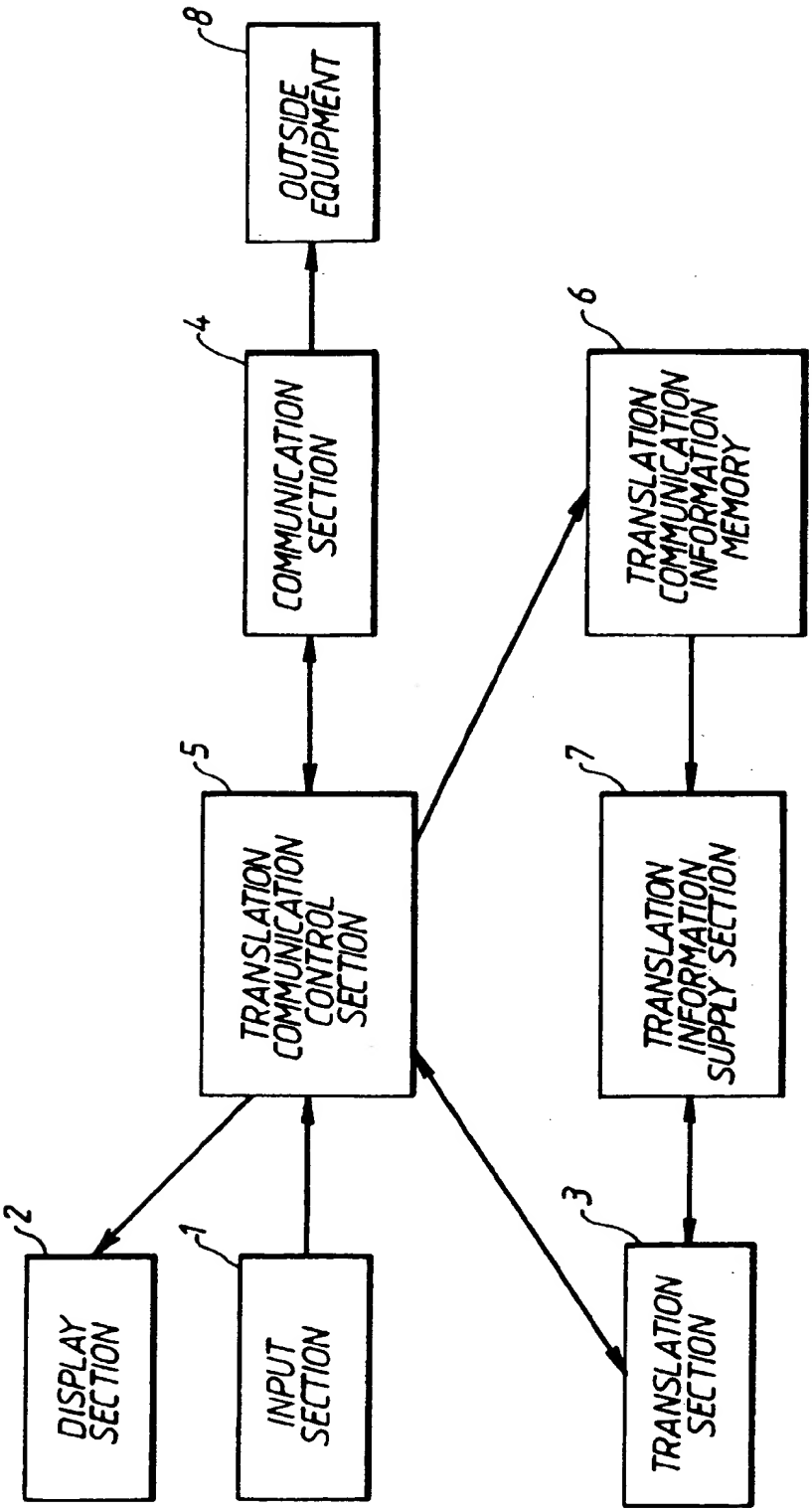

Fig.1.

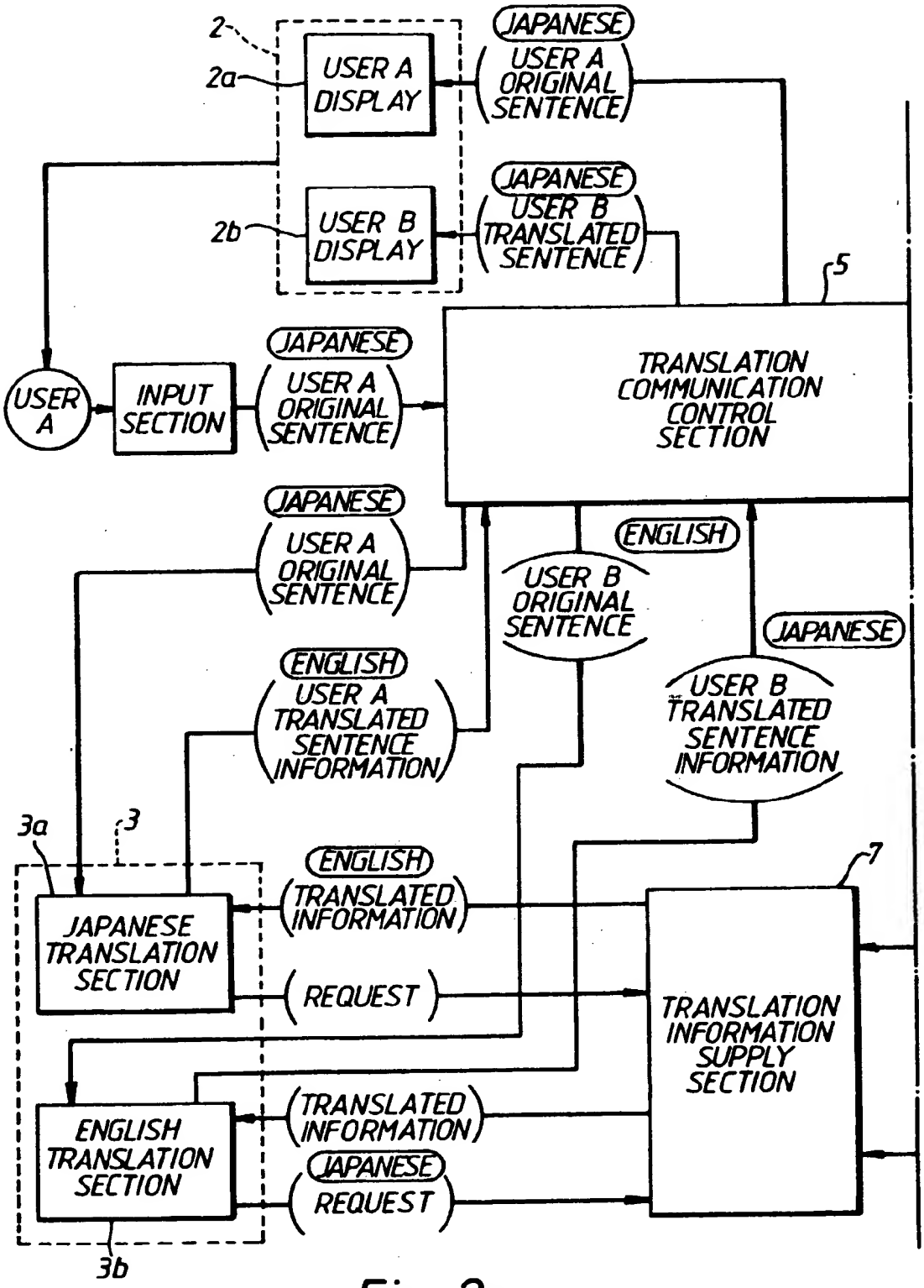

Fig. 2a.

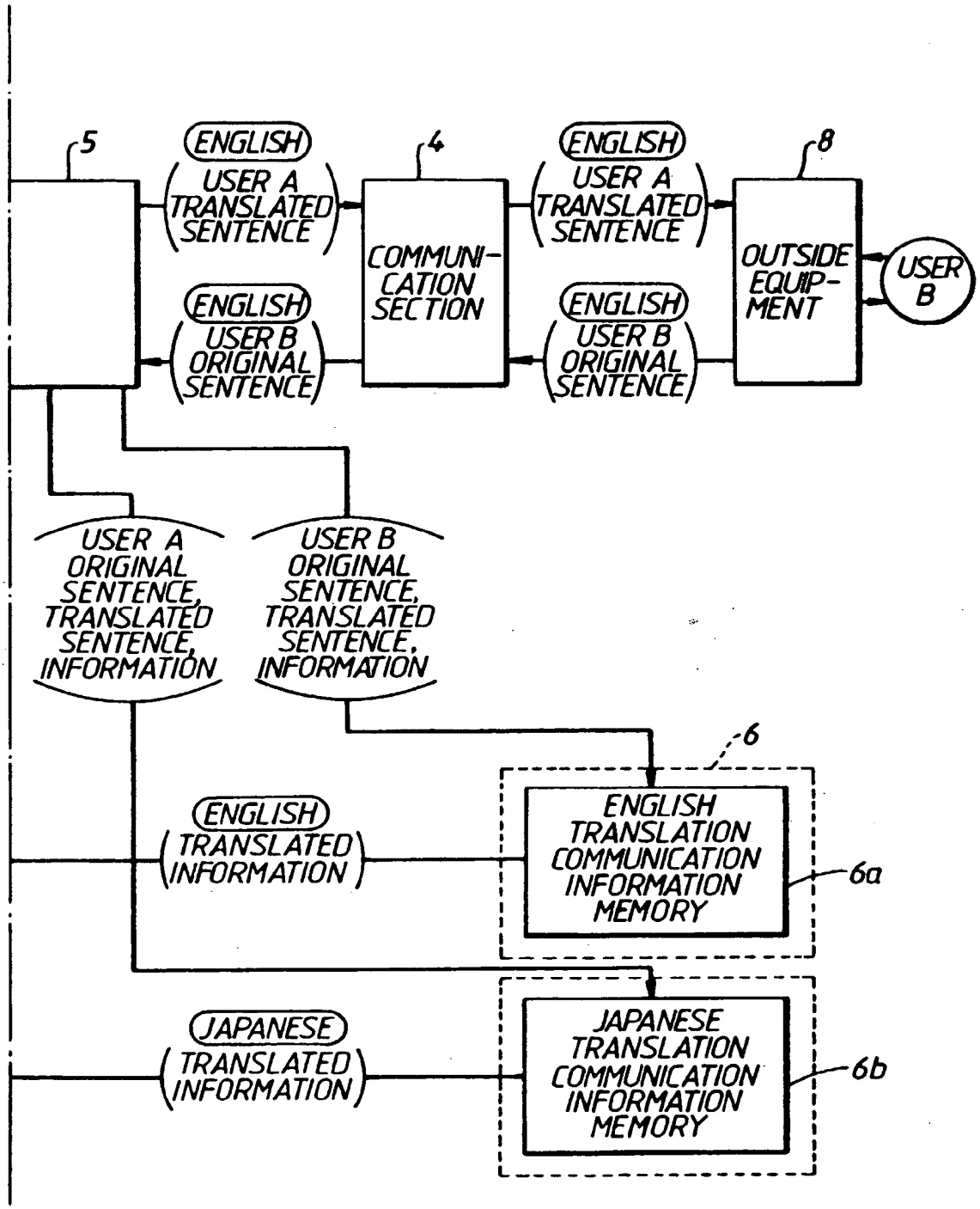

Fig. 2b.

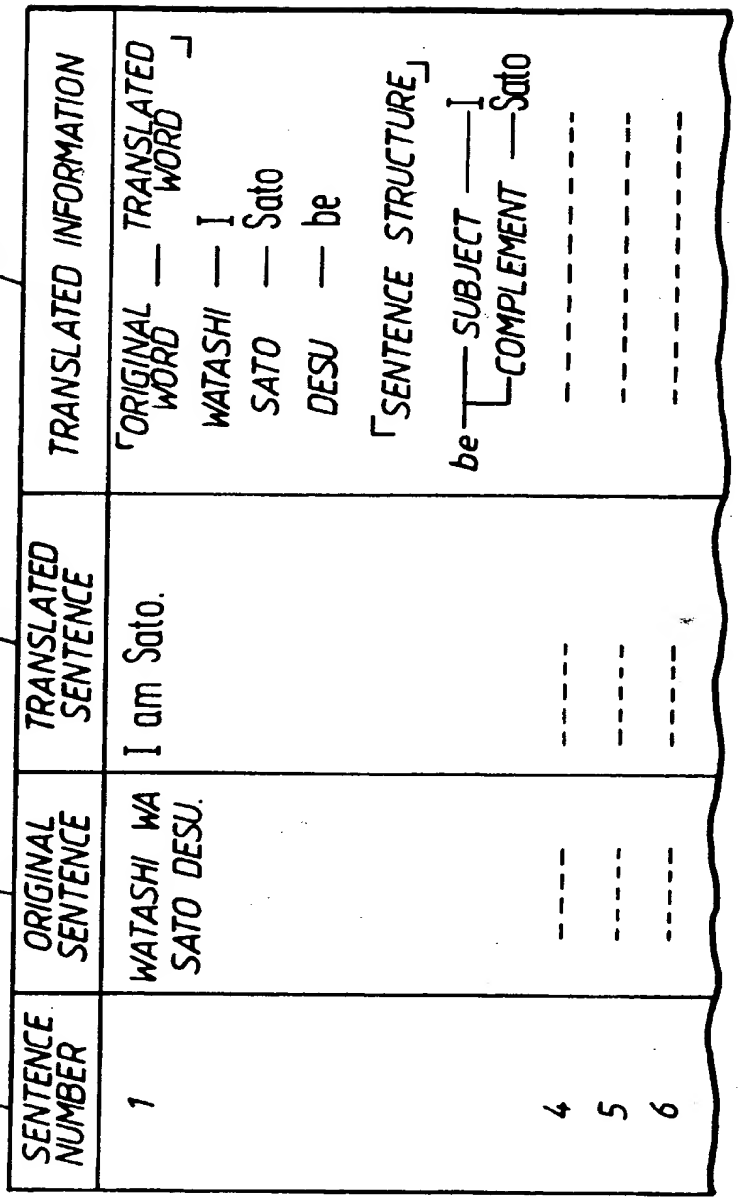

Fig.3.

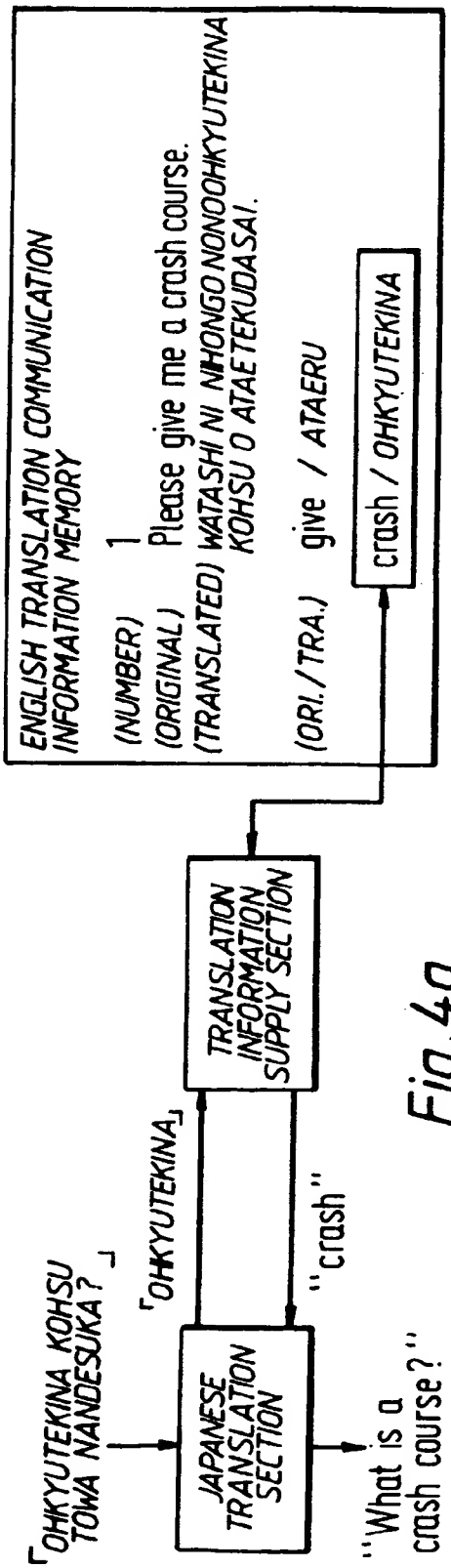

Fig. 4a.

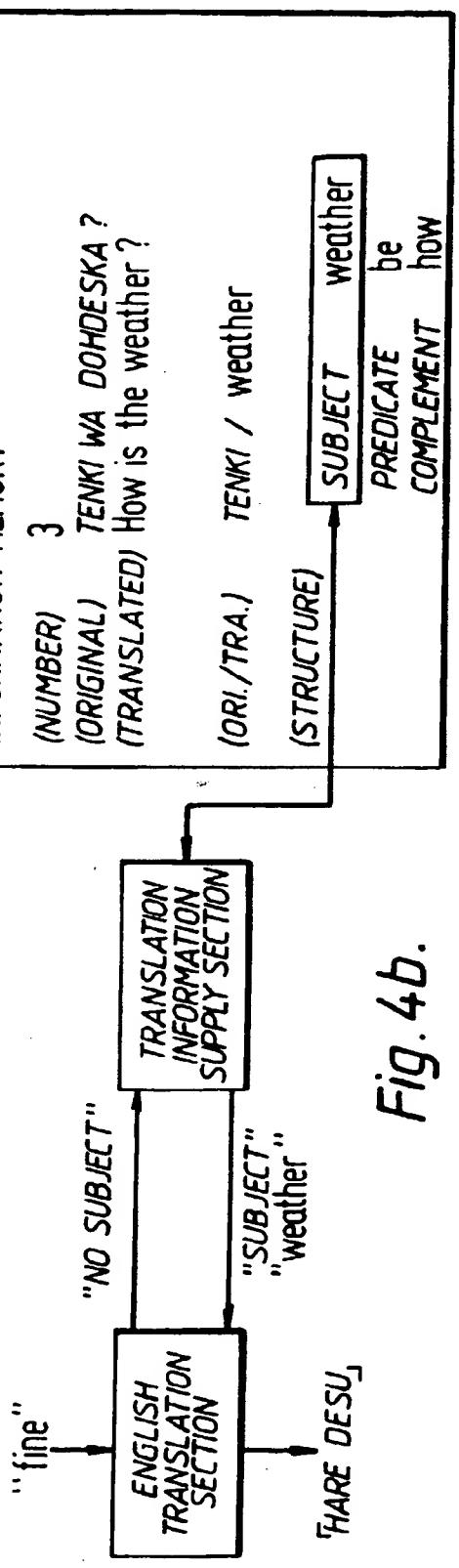

Fig. 4b.

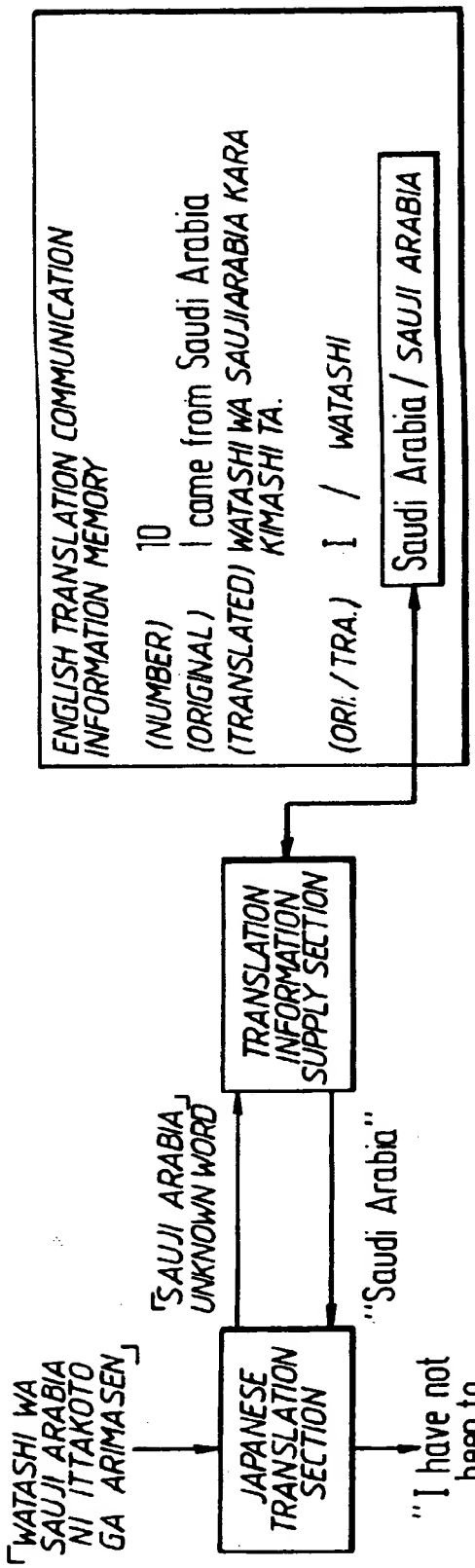

Fig. 4c.

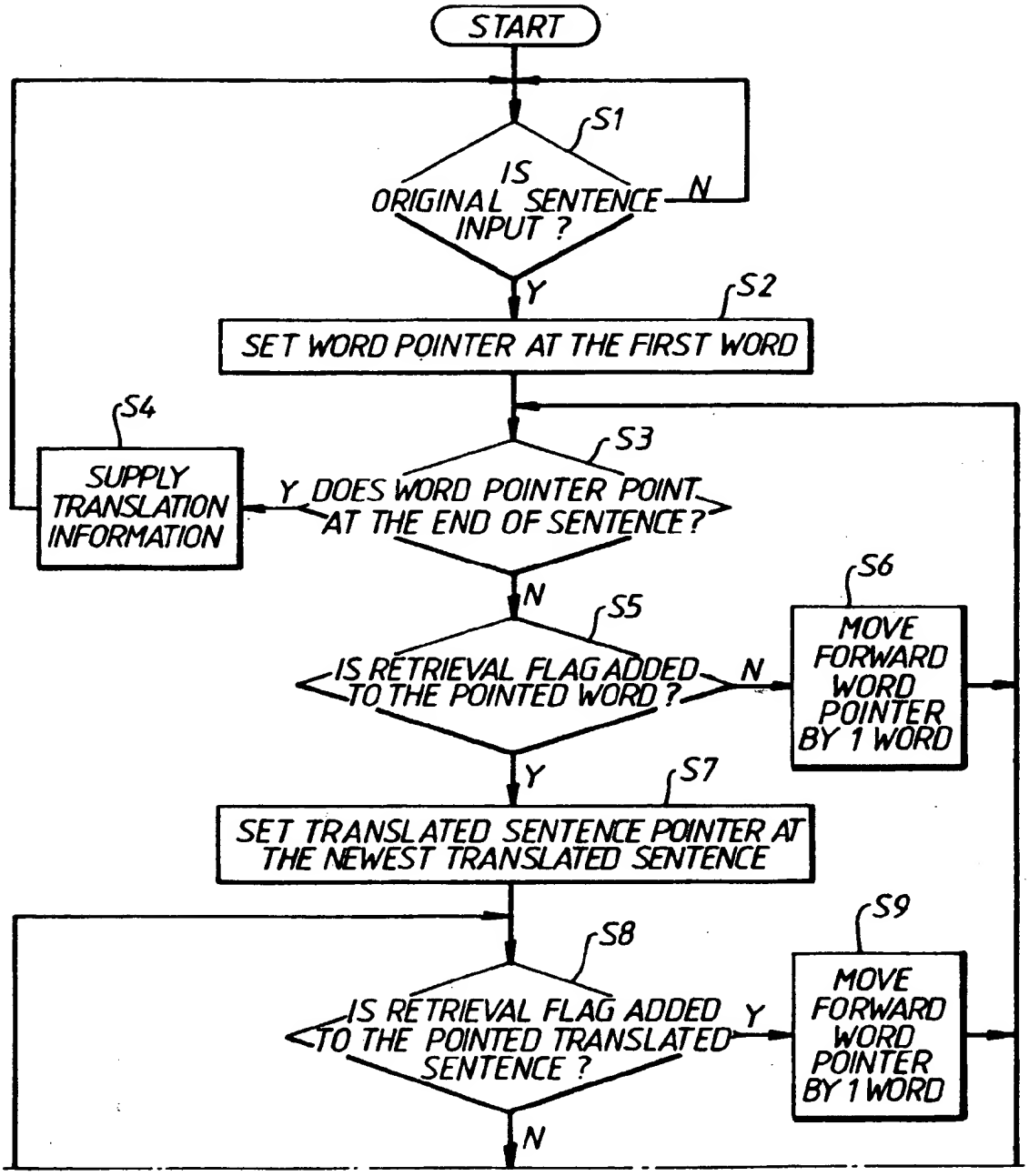

Fig. 5a.

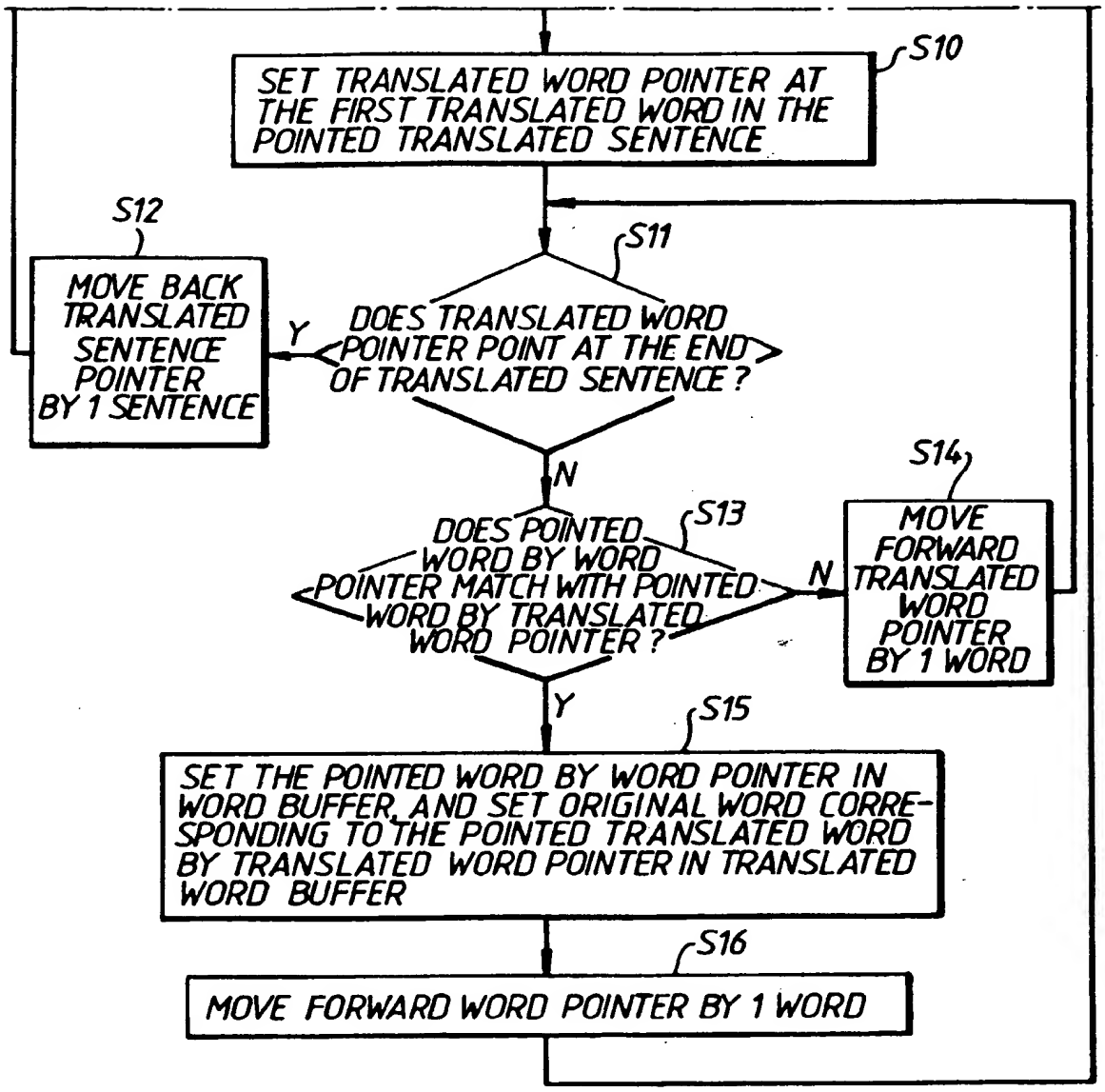

Fig.5b.